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EXAMINER

GRAHAM, ANDREW R

ART UNIT	PAPER NUMBER
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2644

DATE MAILED: 12/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/472,818

Applicant(s)

YAMAYA, KIYOHICO

Examiner

Andrew Graham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 July 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Drawings

1. The replacement drawing was received on April 21, 2004. This drawing is approved by the examiner and have been entered in the case.

Claim Rejections - 35 USC § 112

2. The amendments made to Claims 8 and 9 in view of the previous rejections under 35 U.S.C. are approved and have been entered into the case. Accordingly, these previous rejections made to these claims under 35 U.S.C. 112 are withdrawn.

However, **Claim 9** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 recites the limitations "the plurality of bar-like sub-arms" and "the second end" in the third and fifth lines of the claims, though neither of these components are recited in the parent claims, Claims 1 and 7. As such, there is insufficient antecedent basis for these limitations in the claim.

Based on the included limitations, it is noted that Claim 9 may have been intended to be dependent upon Claim 8, and not Claim 7 as currently listed.

Claim Objections

3. **Claims 13 and 14** are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the

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subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Material required by each of these claims is included in the parent claim, Claim 1. Claim 13 includes the limitation "the stationary member is formed as at least one of a cast iron plate, a pin block, ...". Claim 1 recites the limitation "wherein said stationary member is a cast iron plate of a piano body". Thus, the limitation of "at least one of a cast iron plate" of Claim 13 is already met by Claim 1 because Claim 1 specifically includes and equates the stationary member to a cast iron plate. Phrased differently, a rejection of Claim 1 based on a reference that cited a "cast iron plate" would also apply to the "at least one of a cast iron plate" limitation of Claim 13. This rejection would not require any new reference or the noting of any new feature not already applied to meet the limitations of Claim 1. Other elements are listed in Claim 13, such as a pin block, and inner rim, and an outer rim, but these components are listed in the alternative format ("at least one of") such that finding one and only one of the listed components, as would be required for the "cast iron plate" of Claim 1, would properly meet the scope of Claims 13. It is under these considerations that Claims 13 and 14 fail to meet the required "further limiting".

Furthermore, a valid interpretation of Claim 13 directly conflicts with the limitations of Claim 1. As noted above, Claim 1 recites that the stationary member is a cast iron plate of a piano

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body and Claim 13 recites that the stationary member is at least one of a number of components, including a back post. For the purposes of rejection, the verbs "is" of Claim 1 and "is formed as" of Claim 13 do not clearly recite, nor are granted any difference in interpretation. Examination of elements (b1) and (b3) in the applicant's Figure 3 illustrate that the cast iron plate (b1) and a second component listed in Claim 13, such as a back post (b3), are different items. One interpretation of Claim 13 is that the stationary member is formed as a back post, while again, Claim 1 states that the stationary member is a cast iron plate. Thus, Claim 13 states that the stationary member is an element different than the element previously equated to the member in Claim 1.

This response and rejection also applies to the limitations of Claim 14 in view of the limitation of "said sound source member is a sound board" of Claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 5-7, 10, and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jennings et al (USPN 4058045) in

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view of Izdebski et al (USPN 4290331). Hereafter, "Jennings et al" and "Izdebski et al" will be referred to as "Jennings" and "Izdebski", respectively.

Jennings discloses a piano with a sound enhancing system that utilizes a piezoelectric pickup.

Specifically regarding **Claim 1**, Jennings discloses:

A pickup apparatus (60) of a piano (10) (col. 2, lines 32-64; col. 4, line 38), comprising:

a sensor member (61) (col. 4, lines 38-41); and
mechanism having first (side of 63) and a second (side of 66) contact members (col. 4, lines 41-47);

wherein said first contact member (63) engages a stationary member (inertial plate 64) (col. 4, lines 41-43),
said second contact member (66) engages a sound source member (13) (col. 4, lines 44-47),
said stationary member is a cast iron plate of a piano body ("other suitable material"; col. 4, lines 41-43),
said sound source member is a sound board (13) of said piano body (col. 3, lines 4-6; Figure 1),
said sensor member (61) being operatively connected to said mechanism ("sandwiched" to (63), connected via plates (62, 65) to (66); col. 4, lines 39-47),

However, Jennings does not specify:

- that the mechanism with first and second contact members is length adjusting

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- that the mechanism is formed to adjust a quality of the output of said sound source member to said sensor member by adjustably applying a vibration restraining force applied in response to a length of said length adjusting mechanism.

Izdebski discloses a pick-up device for an instrument that involves a threaded contact member used for selectively adjusting the pressure applied to a sounding member of the instrument and thereby adjusting the pressure applied to the sensor means. Specifically, Izdebski discloses a pick-up (7) that includes a piezo-electric crystal (9) which is positioned between a contact post (11) and a screw (12) (col. 1, lines 52-60). This screw (12) can be adjusted to increase or decrease the pressure placed on the crystal (9), and correspondingly, the pressure placed on the bridge (5) of the stringed instrument (1), which in the depicted embodiment is a guitar (col. 1, lines 65-67). The screw (12) and the ability it has to reposition the post (11) reads on "a length-adjusting mechanism provided one or both of first and second contact members". The turning of the screw results in the changing of the distance between the head of the screw and the upper surface of housing (8); as the screw is integrally connected to the overall device (7) and protrudes from surface of the remaining housing (8), it is based on this turning that the mechanism is considered to be length-adjusting.

The turning of the screw (12) alters the pressure on the crystal (9), which substantially alters the quality of the sound output by

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the system, and reads on "the length adjusting mechanism is formed to adjust a quality of the output of said sound source member to said sensor member" (col. 8-12). Again, such turning affects the amount of the screw protruding from the upper surface of the apparatus, thereby affecting the overall length of the apparatus, which reads on "by adjustably applying a vibration restraining force applied in response to a length of said length adjusting mechanism".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to implement at least the screw, if not the screw and the post of Izdebski to the housing of the piezoelectric pickup device of the system of Jennings. Such a modification is understood to involve the screw protruding from the non-sound board side of the crystal (61) of Jennings, considering the parallel operation of the soundboards and relatively inertial natures of the plates of Jennings and housing of Izdebski. The motivation behind such a modification would have been that such a screw and post would have enabled a user to alter the quality of sound produced by the pickup and thus experimentally find the optimal setting of the piezoelectric component.

Regarding **Claim 5**, Jennings discloses the use of a pickup holder (22) in one embodiment of the pickup apparatus (20) that is rigidly secured to the plate (32) (col. 3, lines 23-26). The screw (12) of Izdebski makes use of threads (13) on the upper surface of the housing (8) to connect the adjustment means (12) to this support (8) (col. 1, lines 60-65). Either of the means for the rigid securing

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or the threads reads on "wherein said first and second members are in contact with said stationary member and and said sound source member, respectively, through at least one mounting".

Regarding **Claim 6**, Jennings teaches the use of piezoelectric means (61), as does Izdebski (9), which reads on "piezoelectric force pickup means" (col. 4, lines 39-41 OF Jennings).

Regarding **Claim 7**, the device of Izdebski includes a screw (12) secured to a housing (8) through a threaded aperture that, in view of the modifications discussed in regards to Claim 1, reads on a "length adjusting mechanism", (col. 1, lines 62-65). The screw (12) itself reads on "the screw portion (11)". The face of the housing (8) that includes the threaded aperture (13) and connects the screw (12) to the rest of the housing (8) reads on "a main arm member (12) threadedly engaged with the screw portion". In view of the proposed modification of Jennings, such a main arm member or housing would have also corresponded to the rear housing (24) or conducting plate (63) (col. 3, lines 7-10; col. 4, lines 38-41).

Regarding **Claim 10**, please refer to the like teachings of Claim 1, noting that the pickup sensor in the device of Izdebski includes a wooden coupling means (11) for contacting the sound source member. The deformation which contact pressure imparts on this wooden piece reads on "through a contact trace".

Regarding **Claim 13**, please refer to the like teachings of Claim 1, noting that the applicants disclosure details a related invention

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wherein one of the mounting means is attached to the backup plate of the piano (col. 4, lines 41-43).

Regarding **Claim 14**, please refer to the like teachings of Claim 1, noting that the applicants disclosure details a related invention wherein one of the mounting means is attached to the sound board of the piano (col. 4, lines 41-43).

5. **Claim 2** is rejected under 35 U.S.C. 103(a) as being unpatentable over Jennings in view of Izdebski as applied above, and in further view of Nelson (USPN 1994919).

As detailed above, Jennings discloses the use of a piezoelectric sensor to obtain sound waves from the sound board of a piano, and Izdebski discloses a system for adjustably applying pressure to the a piezoelectric crystal, thereby altering the quality of the output sound.

- that one or both of the contact members include angle-adjusting mechanisms

Nelson teaches a pickup device that may be mounted against the sound board of a stringed instrument. Figure 3 illustrates that the pickup device (20) receives vibrations from a sound board (13) through the connection of a pickup arm (23) (col. 2, page 1, lines 34-60). This arm is connected to the pickup (20) through a hub (23'') that pivotally rotates to support the arm (col. 2, lines 47-55). In view of the connection to the sound board provided by Jennings or more particularly the pole (11) of Izdebski, this pivoting hub reads on

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"said first contact member or said second contact member has an angle adjusting mechanism contacting said stationary member or said sound source member at an arbitrary angle".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to incorporate a jointed or angle-adjusting hub in the component that connects the sound board and the pickup in the system of Jennings in view of Izdebski. The motivation behind such a modification would have been that such a connection would have allowed for slight vibratory movement between the relative surface of a the soundboard and the positioning of the pickup device.

6. **Claims 3 and 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Jennings in view of Izdebski as applied above, and in further view of Kitashima (USPN 6087574).

As detailed above, Jennings discloses the use of a piezoelectric sensor to obtain sound waves from the sound board of a piano, and Izdebski discloses a system for adjustably applying pressure to the a piezoelectric crystal, thereby altering the quality of the output sound. The piezoelectric crystal of Jennings is disclosed as having connected leads (30,31), the signal carried upon which is applied to internal speakers (col. 3, lines 41-65).

Specifically regarding Claim 3, Jennings in view of Izdebski do not specify:

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- said sensor member includes at least one detachable electric signal output connector.

Kitashima teaches an upright piano that includes internal speakers.

Regarding Claim 3, Kitashima also discloses the existence of a headphone jack (5d) on the control panel (5c) (col. 9, lines 2-5). Such a jack and the implicitly attached headphone connector for use, in view of the manner in which the signals are obtained in the system of Jennings in view of Izdebski reads on "said sensor member includes at least one detachable electric signal output connector".

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to incorporate a headphone jack as disclosed by Kitashima, as part of the output circuitry of the piezoelectric sensor of the system of Jennings in view of Izdebski. The motivation behind such a modification would have been that such a headphone jack would have enabled a set of headphones to be attached to the system, stopping the output of the internal speakers, which would have enabled the piano user to listen to the audio at a desired level without disturbing others.

Regarding **Claim 15**, please refer to the like teachings of Claim 3.

8. **Claims 11 and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Jennings in view of Izdebski as applied above, and in further view of Pozar (USPN 4242937).

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Regarding **Claim 11**, Jennings discloses the use of a spring (67) and a post (12) (col. 4, lines 47-48). The post reads on a "mass". Other resilient materials are known in the art, aside from springs, including materials such as the foam rubber (10) disclosed by Izdebski (col. 1, lines 53-56). Such material, in view of the resilient material included in the damping of Jennings reads on "viscoelastic body". The spring (67) and post (12) are positioned parallel to one end of the part of the pickup apparatus of Jennings that connects to the inertial mass (64), which reads on "being operatively connected along said length adjusting mechanism".

However, Jennings in view of Izdebski do not specify:

- that the viscoelastic body and mass are in contact with said first contact member

Pozer discloses a system for disposing a pickup device against a vibratory surface using an adjustable, threaded rod. The pickup means (24), which comprises the threaded rod (25) are physically damped by member (100) which comprises alternating layers of resilient material (108) and wood (110) (col. 5, lines 34-38). As can be seen in Figure 5, these layers are connected to the bolt (25) through the locking of a nut (42) and washer (44) (col. 4, lines 33-36). This connection of the foam and wood to the adjustment means of Pozar, in view of the connection between the piezoelectric sensor and plate of the system of Jennings in view of Izdebski, reads on "a viscoelastic body and a mass in contact with said first contact member".

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To one of ordinary skill in the art at the time the invention was made, it would have been obvious to connect foam and mass, as is disclosed by Pozar to the screw connecting the piezoelectric sensor and stationary support in the system of Jennings in view of Izdebski. The motivation behind such a modification would have been that such a foam and mass would have progressively decreased the amount of force applied to more distant or external stationary layers of material, such as the post or plate of Jennings, as is accomplished for the lowest level of wood in the system of Pozar. This decrease in force at more distant stationary layers is based on the nature of the foam or resilient material, which comprises a coefficient of vibration reduction or absorption of motional force that would provides the damping noted by Pozar, as would have been recognized by one of ordinary skill in the art.

Regarding **Claim 12**, while a variety of resilient materials are known for various absorption coefficients, Izdebski notes the use of foam rubber (10), which reads on "the viscoelastic body (25) is made of rubber or sponge" (col. 1, lines 53-60).

7. **Claims 8 and 9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Jennings in view of Izdebski as applied above, and further in view of Rowe (USPN 3869952).

As detailed above, Jennings discloses the use of a piezoelectric sensor to obtain sound waves from the sound board of a piano, and Izdebski discloses a system for adjustably applying pressure to the a

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piezoelectric crystal, thereby altering the quality of the output sound.

Regarding **Claim 8**, as discussed above, the housing (8) of Izdebski or the rear housing (24) or conducting plate (63) of Jennings read on "main arm member" and the contact of which to the backplate (64) as taught by Jennings reads on "said first contact member comprises said main arm member". The teachings of Jennings in view of Izdebski dictate an opening on the end of the piezoelectric pickup housing opposite of the sound board at least for the projection of the user adjustable screw.

Yet, in terms of the specifics in which the pick-up device is secured to the piano, Jennings in view of Izdebski in view of the applicant's admitted prior art does not specify:

- that the main arm member is in contact with bar-like subarms extending from the main arm member that are in contact with the stationary member

Rowe discloses a device for variable positioning a pickup in relation to a sound producing part of an instrument using multiple legs.

Specifically regarding **Claim 8**, Rowe teaches:

said main arm member (16) in contact with a plurality of bar like sub arms (26,27) (col. 3, lines 14-38),
each sub arm (26,27) mounted at a first end (one surface, base (17), opposite of sound source strings (11)) to said main arm member (16) (col. 3, lines 19-21)

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and a second end of each sub arm (26,27) is in contact (via 19) with said stationary member of a piano body (rigidity of opening, see col. 3, lines 49-57 of Rowe, in view of location of opening for Jennings in view of Izdebski; col. 4, lines 5-9 of Rowe).

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to utilize adjustable legs to secure the end of the pickup apparatus to the stationary member of Jennings in view of Izdebski, as is constructed between the base of the pickup and reinforced opening of Rowe. The motivation behind such a modification would have been that such legs would have enabled the pickup of Jennings in view of Izdebski to be variably positioned against the sound board in regards to the relative mounting location of the pickup. Such legs would have also enabled the pickup device to be variably installed in different sizes of such openings. Izdebski discloses that a hole for at least the screw portion of the sensor adjustment screw on the side of the pickup opposite the sound board.

Regarding **Claim 9**, Rowe discloses the use of C-shaped members on the ends of the legs (26,27), which read on "each of the plurality of bar like sub arms is provided at the second end with a projecting contact portion" (col. 4, lines 5-22).

Response to Arguments

Applicant's arguments filed July 9, 2004 have been fully considered but are moot in view of the new ground(s) of rejection, presented above.

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Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Paul (USPN 3725561) discloses a pickup apparatus for musical instruments with a vibrating surface, examples of which are given as both percussion and stringed instruments. The connection between the pickup and the vibrating surface is based on the turning of a threaded support for the pickup.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Graham whose telephone number is 703-308-6729. The examiner can normally be reached on Monday-Friday, 8:30 AM to 5:00 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Isen can be reached on (703)305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Andrew Graham

Examiner

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December 13, 2004

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XU MEI
PRIMARY EXAMINER